

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark
Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year)

29 July 1998 (29.07.98)

International application No.

PCT/GB97/03344

Applicant's or agent's file reference

J24468 WO

International filing date (day/month/year)

04 December 1997 (04.12.97)

Priority date (day/month/year)

06 December 1996 (06.12.96)

Applicant

MACRIDIS, Philip et al

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

06 July 1998 (06.07.98)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Marie-José Devillard

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To

MUSKER, David C.
R.G.C. JENKINS & CO.
26 Caxton Street
LONDON EC4V 3PD
GRANDE BRETAGNE

22/11

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing
(day/month/year)

1 2. 10. 98

Applicant's or agent's file reference
J24468 WO

REPLY DUE

within **3 month(s)**
from the above date of mailing

International application no.
PCT/GB97/03344

International filing date (day/month/year)
04/12/1997

Priority date (day/month/year)
06/12/1996

International Patent Classification (IPC) or both national classification and IPC
H04B7/26

Applicant

INTERNATIONAL MOBILE SATELLITE ORGANIZATION et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.

2. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☐ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

REPLY DUE

12/1/99

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and / or arguments, see Rule 66.4bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the International preliminary examination report must be established according to Rule 69.2 is: 06/04/1999

Name and mailing address of the international preliminary examining authority



European Patent Office
D-80295 Munich
Tel (+49-89) 2399-0 Tx. 523656 epmu d
Fax (+49-89) 2399-4465

Authorized officer / Examiner
Phillips, S

Formalities officer (incl. extension of time limits)
Teschauer, B
Telephone No. (+49-89) 2399-8231



WRITTEN OPINION

International application No. PCT/GB97/03344

I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*);

Description, pages:

1-24 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/6-6/6 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

- ☐ the entire international application,
- ☒ claims Nos. 8-16,

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

WRITTEN OPINION

International application No. PCT/GB97/03344

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 8-16.

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/GB97/03344

Reference is made to the following documents:

D1: US 5 446 739

D2: WO 96 08934

Section VII

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.
2. Independent claims 1 and 5 are not in the two part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preambles (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising parts (Rule 6.3(b)(ii) PCT).
3. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
4. There appears to be an error in the usage of reference sign "B" in the description on page 7 line 6.

Section VIII

1. The claims are unclear in the sense of Article 6 PCT for the reasons given below:
 - (a) It is unclear whether the word "comprising" (claim 1 line 4) refers to the method of assigning time slots or to the plurality of calls.
 - (b) "the plurality of timeslots allocated" (claim 1 line 8) has not previously been defined in claim 1 and therefore cannot be referred to in defining the time slot spacing.
 - (c) It is not clear in claim 2 with what other communications device the mobile

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/GB97/03344

terminals are communicating.

- (d) It is not clear whether "said slots" (claim 2 line 4) are intended to be the same as the "time slots" defined in claim 1. The same objection applies to claim 3 lines 5 and 6 and to claim 7 line 3.
- (e) It is not clear in claim 3 line 4 from where the information is transmitted.
- (f) The category of claim 5 is unclear since it makes reference to both an apparatus (line 1) and a method (line 5).

Further comments:

1. Claims 8 to 16 inclusive should be deleted from the application as they have not been searched.
2. If filing amended claims the applicant should at the same time bring the description into conformity with the amended claims. Care should be taken during revision, especially of the introductory portion and any statements of problem or advantage, not to add subject-matter which extends beyond the content of the application as originally filed.

In order to facilitate the examination of the conformity of any amendments with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT). Preferably these indications should be submitted in handwritten form on a copy of the relevant parts of the application as filed.

Our Case: JC/DS/J00024468WO

European Patent Office,
Directorate General 2,
D-80298 Munich,
GERMANY.

17 November, 1998

Dear Sirs,

International Patent Application No. PCT/GB97/03344
International Mobile Satellite Organization
Bandwidth Allocation Method and Apparatus

In response to the Written Opinion of 12th October 1998 (received 2nd November 1998), we file herewith amended page 7 and claims 1 to 16, in triplicate.

We thank the Examiner for the review of the description and claims, in response to which we have made appropriate amendments on the enclosed pages. For the Examiner's assistance, we enclose a copy of the originally filed pages showing the amendments in manuscript. These amendments have been made solely for the sake of clarity and are not intended to limit the scope of the claims in any way. Where amendments have not been made in response to the Examiner's comments, the reasons are given below, using the corresponding paragraph numbering of Section VIII of the Written Opinion.

1 (a) It is clear from the grammatical structure and from the sense of claim 1 that "comprising" in claim 1, line 4 refers to "said calls".

(e) As it is not essential to the subject matter of claim 3 whence the information is transmitted to the mobile terminals, claim 3 is not unclear but merely sufficiently broad to cover the subject matter with appropriate scope.

In relation to Section VII of the Written Opinion, we thank the Examiner for drawing these formal requirements to our attention. However, these amendments would not be necessary in some of the elected states, so we intend to defer amendment to the national phase applications where such amendments are necessary. Likewise, we have not deleted claims 8 to 16 as the lack of unity objection raised during the international search may not apply in some of the elected states.

Yours faithfully,

James P A Cross
Authorised Representative
R G C JENKINS & CO

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

MUSKER, David C.
R.G.C. JENKINS & CO.
26 Caxton Street
LONDON SW1H 0RJ
GRANDE BRETAGNE

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing
(day/month/year)

01.03.99

Applicant's or agent's file reference

J24468 WO

REPLY DUE

within ~~4 month(s)~~ *two weeks*
from the above date of mailing

International application No.

PCT/GB97/03344

International filing date (day/month/year)

04/12/1997

Priority date (day/month/year)

06/12/1996

International Patent Classification (IPC) or both national classification and IPC

H04B7/26

Applicant

INTERNATIONAL MOBILE SATELLITE ORGANIZATION et al.

1. This written opinion is the **second** drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

URGENT

REPLY DUE

15/3/99

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 06/04/1999.

Name and mailing address of the international preliminary examining authority:



European Patent Office
D-80298 Munich
Tel (+49-89) 2399-0 Tx: 523656 epmu d
Fax: (+49-89) 2399-4465

Authorized officer / Examiner

Phillips, S

Formalities officer (incl. extension of time limits)

Teschauer, B

Telephone No. (+49-89) 2399 9231



WRITTEN OPINION

International application No. PCT/GB97/03344

I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as 'originally filed'.*):

Description, pages:

1-6.8-24	as originally filed		
7	as received on	18/11/1998 with letter of	17/11/1998

Claims, No.:

1-16	as received on	18/11/1998 with letter of	17/11/1998
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Drawings, sheets:

1/6-6/6	as originally filed
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2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

- ☐ the entire international application.
- ☒ claims Nos. 8-16.

because:

WRITTEN OPINION

International application No. PCT/GB97/03344

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 8-16.

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-3,5,7 (no)
Inventive step (IS)	Claims	1-7 (no)
Industrial applicability (IA)	Claims	

2. Citations and explanations**see separate sheet****VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

see separate sheet**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/GB97/03344

Reference is made to the following documents:

D1: US 5 446 739

D2: WO 96 08934

Section V

1. After careful consideration, it has been decided that the feature distinguishing the application from the prior art is merely the terminology "real-time calls" and "non real-time calls", which may be subjected to varying interpretations and are not in themselves limiting features of the claims.
2. Document D1 is regarded as being the closest prior art to the subject matter of **claims 1 and 5** and discloses:

A method of [and corresponding apparatus for] assigning time slots within a frame of a TDMA frequency channel to a plurality of calls between a base station and one or more mobile terminals (column 1 lines 5-13 and Figure 1), said calls being either real-time calls or non real-time calls [which have less sensitivity to delay than real-time calls] and comprising at least one real-time call requiring a plurality of time slots per frame ("non-audio data" column 4 lines 26-33); the method comprising: determining which of said calls are real-time calls requiring allocation of a plurality of time slots per frame; and allocating said time slots in said frame to said calls (column 4 lines 26-33) such that the plurality of time slots allocated to the or each said real-time call are mutually spaced apart in said frame (column 4 lines 48-50 and Figure 2).

Thus the subject-matter of **claims 1 and 5** is not novel (Article 33(2) PCT).

The definition of "real-time calls" and "non real-time calls" is arbitrary, depending on the requirements of the type of information to be transmitted and the transmission parameters of the communications system. In D1, the non-audio data requires two time slots per frame whereas the audio data requires only time slot per frame, and thus the non-audio data could be referred to as "real-time" since it requires the allocation of more than one slot per frame. Under different

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/GB97/03344

transmission circumstances and/or different signal quality requirements, it could equally be that the audio data might require the allocation of more than one slot per frame, in which case it could be referred to as "real-time". Thus even if the claims were modified to include specific data types, the subject matter would still lack an inventive step in the sense of Article 33(3) PCT, since it is obvious to allocate more than one slot per frame to calls requiring the allocation of more than one slot per frame, whatever the data type. This is known, for example, from document D2 (page 2 lines 5-10), which also relates to digital data transmission in a TDMA telephony system.

3. The following dependent claims do not contain any features which, in combination with the features of any independent claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being:

Claims 2,7: This subject matter is known from D1 column 6 lines 1-4. It is also disclosed in D2 on page 6 lines 1-2.

Claim 3: This subject matter is known from D1 column 5 lines 36-52. It is also disclosed in D2 on page 6 lines 7-12.

Claims 4, 6: It would be obvious to allocate remaining non-allocated slots to further calls in order to provide good quality communications for those calls, by making maximum use of the bandwidth available. This is known, for example, from document D2 (page 2 lines 5-10).

Section VII

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.
2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

**WRITTEN OPINION
SEPARATE SHEET**

International application No. PCT/GB97/03344

Section VIII

1. The claims are unclear in the sense of Article 6 PCT for the reasons given below:

(a) It is not clear whether "the allocated slots" (claim 3 line 6) are intended to be the same as the "time slots" defined in claim 1.

Further comments:

1. Reply to this written opinion is due within **2 weeks** of the date of mailing.
2. **Claims 8 to 16** inclusive should not be present in the application as they have not been searched.
3. If amended independent claims are filed, these should be in the two part form in accordance with Rule 6.3(b) PCT, with those features known in combination from the prior art acknowledged in the description being placed in the preambles (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising parts (Rule 6.3(b)(ii) PCT).

The applicant should at the same time bring the description into conformity with the amended claims. Care should be taken during revision, especially of the introductory portion and any statements of problem or advantage, not to add subject-matter which extends beyond the content of the application as originally filed.

In order to facilitate the examination of the conformity of any amendments with the requirements of Article 34(2)(b) PCT, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based (see also Rule 66.8(a) PCT). Preferably these indications should be submitted in handwritten form on a copy of the relevant parts of the application as filed.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To,

MUSKER, David C.
R.G.C. JENKINS & CO.
26 Caxton Street
LONDON SW1H 0RJ
GRANDE BRETAGNE

PCT

NOTIFICATION CONCERNING INFORMAL
COMMUNICATIONS WITH THE APPLICANT

(PCT Rule 66.6)

Date of mailing
(day/month/year)

01.03.99

Applicants or agent's file reference

J24468 WO

TRANSMITTAL FOR INFORMATION

International application no.

PCT/GB97/03344

International filing date (day/month/year)

04/12/1997

Applicant

INTERNATIONAL MOBILE SATELLITE ORGANIZATION et al.

An informal communication took place on 26/02/1999, between the International Preliminary Examining Authority and the applicant / the agent.

A copy of the note on that communication (Form PCT/IPEA/428) is herewith transmitted for your information.

Name and mailing address of the international
preliminary examining authority



European Patent Office
D-80298 Munich
Tel (+49-89) 2395-C Tx: 523555 epmu d
Fax (+49-89) 2395-4465

Authorized officer

Teschauer, B

Telephone No. (+49-29) 2399-8231



Form PCT/IPEA/429 (july 1993)

Vertrag über internationale Zusammenarbeit auf dem Gebiet des Patentwesens
Patent Cooperation Treaty
Traité de coopération en matière de brevets

PCT

Application No.:

PCT/GB97/03344

Note on an informal communication by telephone with the Applicant

A copy of this note is being sent to the Applicant for information

Participants

Applicant: International Mobile Satellite Organisation et al.

Agent: R. G. C. Jenkins & Co.

Examiner(s): Phillips, S

Summary of the communication

The representative was informed that since the written opinion mailed on 12.10.1998, and after careful consideration of the application, the examiner has decided that the feature distinguishing the application from the prior art is merely the terminology "real-time calls" and "non real-time calls".

The representative was informed that subject matter of **claims 1 and 5** appears to be disclosed in the document US 5 446 739 (D1) in column 4 lines 26-33, lines 48-50 and in figure 2, and that **claims 1 and 5** therefore lack novelty in the sense of Article 33(2) PCT.

The agreement of the representative was sought to send a second Written Opinion with a two week time limit set to enable the applicant to reply before the issue of the International Preliminary Examination Report.

The representative agreed.

Vertrag über internationale Zusammenarbeit auf dem Gebiet des Patentwesens
Patent Cooperation Treaty
Traité de coopération en matière de brevets

PCT

Application No.:

PCT/GB97/03344

26/02/1999

Date (day / month / year)



Phillips, S

Authorized officer of IPEA

FACSIMILE MESSAGE

TO: The Int'l Preliminary Examining
Authority
FAX NO:00 4989 2399 4465
FROM: R G C Jenkins & Co
NO. OF PAGES 3

Our Case: JC/DS/J00024468WO

European Patent Office,
Directorate General 2,
D-80298 Munich,
GERMANY.

15 March, 1999

Dear Sirs,

International Patent Application No. PCT/GB97/03344
International Mobile Satellite Organization
Bandwidth Allocation Method and Apparatus

In response to the second Written Opinion dated 1st March 1999, we file herewith amended page 26 and present the following comments:

First, we are grateful for the issue of the second Written Opinion to enable us to respond to the objections raised after further consideration by the Examiner. Of course, it would have been preferable to have raised these objections in the first Written Opinion.

On careful study of US 5,446,739, it appears to us that claim 1 is clearly novel over this citation and moreover involves an inventive step. Specifically, claims 1 and 5 recite respectively a method and apparatus for:

“..... assigning time slots within a frame of a TDMA frequency channel”

including a method or means for allocating time slots:

“.....such that the plurality of time slots allocated to the or each of said real-time calls are mutually spaced apart in said frame.”

While D1 does disclose assigning two slots to one data communication in a TDMA frame (see abstract), the time slots of each frame of D1 occupy different frequency channels (see Figure 1 and column 4, lines 34 to 43). As a result of this arrangement, two time slots

assigned to the same portable station have to be spaced apart by at least one time slot interval (see column 4, lines 44 to 55); the time slot interval gives the portable station enough time to tune to the carrier frequency of the other slot (see also the problem stated in column 1, lines 26 to 29).

However, if in D1 the two slots occupy the same carrier frequency, the controller assigns these two slots adjacent to each other (see abstract, penultimate sentence and column 9, lines 46 to 52 and column 9, line 67 to column 10, line 3).

In summary, claims 1 and 5 are novel, because D1 does not disclose, in the context of a call requiring a plurality of time slots per TDMA frame, allocating those time slots in a mutually spaced apart fashion in the same frequency channel.

Neither does D1 indicate a lack of inventive step in claims 1 and 5. The problem addressed by D1 is the inability of a receiver in a portable terminal to change carrier frequency from one slot to another (see column 1, lines 26 to 29). As a solution to this problem, D1 teaches that, where a portable station needs to receive two slots per frame on different carrier frequencies, these slots should be spaced apart so as to give the receiver enough time to retune. However, if the two or more slots are assigned on the same carrier frequency, D1 teaches that these slots should be adjacent.

There is no suggestion in D1 of the problem addressed by the invention defined in claims 1 and 5, that the maximum delay encountered by data transmitted in multiple TDMA slots in a frame can be affected by the allocation scheme chosen for those slots (see page 22, lines 17 to 20). Therefore, it cannot be seen how the skilled reader would consider the invention defined in claims 1 and 5 on the basis of D1.

The second Written Opinion also discussed the terminology "real-time calls" and "non real-time calls" and states that these are not in themselves limiting features of the claims. However, as this terminology is not the only distinction over D1, it does not appear necessary to discuss it further at this stage.

In response to the clarity objection raised against claim 3 lines 6 of Section VIII of the Written Opinion, we have amended page 26 so that on line 6 of claim 3, "the allocated slots" has been replaced by "said allocated slots".

It appears that points 2 and 3 of the Further Comments in the second Written Opinion have been raised for the sake of good order, to show that the same comments in the first Written Opinion have not been complied with. As indicated in our letter of 17th November 1998, we prefer not to comply with these requirements at this stage.

Yours faithfully,

James P A Cross
Authorised Representative
R G C JENKINS & CO

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ _____

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty.

For International Preliminary Examining Authority use only	
Identification of IPEA	Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION	
Applicant's or agent's file reference J.24468 WO	
International application No. PCT/GB97/03344	International filing date (day/month/year) 4th December 1997
(Earliest) Priority date (day/month/year) 6th December 1996	
Title of invention BANDWIDTH ALLOCATION METHOD AND APPARATUS	
Box No. II APPLICANT(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
International Mobile Satellite Organization 99 City Road London EC1Y 1AX GB	
Telephone No.:	
Facsimile No.:	
Teleprinter No.:	
State (i.e. country) of nationality: International Organisation established under Treaty	State (i.e. country) of residence: GB
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
MACRIDIS, Philip 60c Warrington Crescent London W9 1EP GB	
State (i.e. country) of nationality: GR	State (i.e. country) of residence: GB
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
HARPER, John Anthony Boite Postale 32 F-06560 Valbonne FR	
State (i.e. country) of nationality: GB	State (i.e. country) of residence: FR
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.	

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representative
 and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.
☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.
☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

MUSKER, David C
 R G C Jenkins & Co
 26 Caxton Street
 London SW1H 0RJ
 GB

Telephone No.:

0171 931 7141

Facsimile No.:

0171 222 4660

Teleprinter No.:

894707

☐ Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV STATEMENT CONCERNING AMENDMENTS

The applicant wishes the International Preliminary Examining Authority*

- (i) ☒ to start the international preliminary examination on the basis of the international application as originally filed.
- (ii) ☐ to take into account the amendments under Article 34 of
- ☐ the description (amendments attached).
 - ☐ the claims (amendments attached).
 - ☐ the drawings (amendments attached).
- (iii) ☐ to take into account any amendments of the claims under Article 19 filed with the International Bureau (a copy is attached).
- (iv) ☐ to disregard any amendments of the claims made under Article 19 and to consider them as reversed.
- (v) ☐ to postpone the start of the international preliminary examination until the expiration of 20 months from the priority date unless that Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Box No. V ELECTION OF STATES

☒ The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)* except

.....

.....

(If the applicant does not wish to elect certain eligible States, the name(s) or country code(s) of those States must be indicated above.)

Box No. VI CHECK LIST

The demand is accompanied by the following documents for the purposes of international preliminary examination:

- | | | |
|----------------------------------------------------|---|--------|
| 1. amendments under Article 34 | | |
| description | : | sheets |
| claims | : | sheets |
| drawings | : | sheets |
| 2. letter accompanying amendments under Article 34 | : | sheets |
| 3. copy of amendments under Article 19 | : | sheets |
| 4. copy of statement under Article 19 | : | sheets |
| 5. other (specify): | : | sheets |

For International Preliminary Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- | | |
|--------------------------------------------------------------------|--------------------------------------------------------------|
| 1. <input type="checkbox"/> separate signed power of attorney | 4. <input checked="" type="checkbox"/> fee calculation sheet |
| 2. <input type="checkbox"/> copy of general power of attorney | 5. <input type="checkbox"/> other (specify): |
| 3. <input type="checkbox"/> statement explaining lack of signature | |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

David C Musker
R G C Jenkins & CO

3rd July 1998

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.


For International Bureau use only

Demand received from IPEA on:

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference J24468 WO		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) FOR FURTHER ACTION	
International application No. PCT/GB97/03344	International filing date (day/month/year) 04/12/1997	Priority date (day/month/year) 06/12/1996	
International Patent Classification (IPC) or national classification and IPC H04B7/26			
Applicant INTERNATIONAL MOBILE SATELLITE ORGANIZATION et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 8 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none">I <input checked="" type="checkbox"/> Basis of the reportII <input type="checkbox"/> PriorityIII <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicabilityIV <input type="checkbox"/> Lack of unity of inventionV <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statementVI <input type="checkbox"/> Certain documents citedVII <input checked="" type="checkbox"/> Certain defects in the international applicationVIII <input checked="" type="checkbox"/> Certain observations on the international application			
Date of submission of the demand 06/07/1998		Date of completion of this report 24.03.99	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465		Authorized officer Phillips. S Telephone No. (+49-89) 2399 8674	



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB97/03344

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-6.8-24	as originally filed		
7	as received on	18/11/1998	with letter of 17/11/1998

Claims, No.:

1,2,3 (part), 6-16	as received on	18/11/1998	with letter of 17/11/1998
3 (part),4,5	with telefax of	15/03/1999	

Drawings, sheets:

1/6-6/6	as originally filed
---------	---------------------

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB97/03344

- ☐ the entire international application.
- ☒ claims Nos. 8-16.

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 8-16.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-7
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-7
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB97/03344

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

D1: US 5 446 739

Section V

1. The application relates to a method (**claim 1**) and apparatus (**claim 5**) for assigning time slots within a frame of a TDMA frequency channel to a plurality of calls between a base station and one or more mobile terminals.
2. Document D1 which is regarded as being the closest prior art to the subject matter of **claims 1 and 5** discloses:

A method of [and corresponding apparatus for] assigning time slots within a frame of a TDMA channel to a plurality of calls between a base station and one or more mobile terminals (column 1 lines 5-13 and Figure 1), said calls being either real-time calls or non real-time calls [which have less sensitivity to delay than real-time calls] and comprising at least one real-time call requiring a plurality of time slots per frame ("non-audio data" column 4 lines 26-33); the method comprising: determining which of said calls are real-time calls requiring allocation of a plurality of time slots per frame; and allocating said time slots in said frame to said calls (column 4 lines 26-33) such that the plurality of time slots allocated to the or each said real-time call are mutually spaced apart in said frame (column 4 lines 48-50 and Figure 2).

The present claims differ from the disclosure of D1 in that the plurality of time slots per frame occupy a TDMA frequency channel.

Thus the subject-matter of **claims 1 and 5** is novel (Article 33(2) PCT).

3. Problem: How to allocate time slots in a TDMA frequency channel in such a way as to minimise the delay encountered by data transmitted in multiple time slots per frame.
4. Solution: The feature linking **claims 1 and 5** which is new with respect to the

available prior art is to allocate time slots in a frame of a TDMA frequency channel to calls such that the plurality of time slots allocated to the or each real-time call are mutually spaced apart in the frame.

None of the available prior art documents provide any hint to do this and, in fact, document D1 teaches away from this solution and states that if two or more slots are assigned on the same carrier frequency then they should be adjacent to each other (column 9 lines 46-52) and that time slots should be spaced apart in a frame in a case where they occupy different frequency channels (Column 4 lines 41-50 and Figure 2 row 10b). The problem to be solved in D1 is that of allowing sufficient time for a receiver to change frequency channels between time slots of a frame and it does not suggest the spacing apart of slots in a frame which occupy the same frequency channel. Hence the particular solution is non-obvious and considered to be inventive

5. The dependent claims add further features to the independent claims and thus also relate to novel and inventive subject matter and hence meet the requirements of Article 33(2) and (3) PCT.

Section VII

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in document D1 is not mentioned in the description, nor is this document identified therein.
2. Independent claims 1 and 5 are not in the two part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preambles (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising parts (Rule 6.3(b)(ii) PCT).
3. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB97/03344

Section VIII

1. The claims are unclear in the sense of Article 6 PCT for the reasons given below:
 - (a) It is not clear from the wording of **claims 1 and 5** that the "frame" (lines 8 and 10) is a frame of "a TDMA frequency channel" (line 1) which is the single feature distinguishing the claims from the prior art.
 - (b) It is not clear whether the expression "said allocated slots" (**claim 3** line 6) is intended to refer to the "allocated time slots" defined in claim 1 line 11.

Further comments:

1. Claims 8 to 16 inclusive should not be present in the application as they have not been searched.

having multibeam receive/transmit antennas for receiving and transmitting signals in each of a plurality of spot beams B. Each spot beam B carries a plurality of frequency channels both in the forward and return directions. The satellite also receives and transmits in a global beam G which has a coverage area extending substantially or completely over the coverage areas of the spot beams B. The global beam G carries at least one forward and one return frequency channel.

The RF signals transmitted between the antenna 10 and satellite 12 comply with an air interface protocol I3, which will be more fully described hereafter. The satellite 12 acts as a repeater and converts channels from multiple spot beams B into channels in a feeder beam F and vice versa. The feeder beam F provides a link between the satellite 12 and an earth station 16 via an earth station antenna 14. The air interface protocol over the feeder beam F is referenced as I3F in Fig. 1.

The network management centre 18 is connected to the earth station 16 and includes a number of different service adaptors 20a, 20b, 20c, 20d providing an interface to terrestrial networks 22, such as PSTN, ATM networks or ISDN. For example, the service adaptors 20 may comprise a telephony adaptor 20a including a codec for converting voice signals on a PSTN to data at the network management centre 18 and *vice versa*. A facsimile service adaptor 20b may implement facsimile protocols, such as defined in ITU Recommendations T.30 and T.4 and include a modem for communication over

CLAIMS

1. A method of assigning time slots within a frame of a TDMA frequency channel to a plurality of calls between a base station and one or more mobile terminals, said calls being either real-time calls or non real-time calls and comprising at least one real-time call requiring a plurality of time slots per frame; the method comprising:

determining which of said calls are real-time calls requiring allocation of a plurality of time slots per frame; and

10 allocating said time slots in said frame to said calls such that the plurality of time slots allocated to the or each said real-time call are mutually spaced apart in said frame.

2. A method as claimed in claim 1, wherein said TDMA frequency channel is a forward channel for communication from said base station to said one or more mobile terminals, the method further comprising transmitting call signals in said time slots in accordance with the allocation of said time slots.

3. A method as claimed in claim 1, wherein said TDMA frequency channel is a return channel for communication from said one or more mobile terminals to said base station. the method further comprising:

transmitting to said one or more mobile terminals information relating to the allocation of said time slots in the return channel, such that call signals are transmitted by said one or more mobile terminals in said allocated slots of the return channel.

5

4. A method as claimed in any preceding claim, further comprising allocating one or more time-slots to each said non-real-time call from the time slots in said frame not allocated to the or each real-time call, the number of said time slots allocated to said non-real-time call being variable during said non-real-time call according to a current bandwidth allocation determined for that non-real-time call.

10

5. Apparatus for assigning time slots within a frame of a TDMA frequency channel to a plurality of calls between a base station and one or more mobile terminals, said calls being either real-time calls or non real-time calls which have less sensitivity to delay than real-time calls and comprising at least one real-time call requiring a plurality of time slots per frame; the apparatus comprising:

15

means for determining which of said calls are real-time calls requiring allocation of a plurality of time slots per frame; and

means for allocating said time slots in said frame to said calls such that the plurality of time slots allocated to the or each of said real-time calls are mutually spaced apart in said frame.

20

AMENDED SHEET

6. __ Apparatus as claimed in claim 5, wherein said means for allocating are further arranged to allocate one or more time-slots to each said non-real-time call from the time slots in said frame not allocated to the or each real-time call, the number of said time slots allocated to said non-real time call being variable during
5 said non-real-time call according to a current bandwidth allocation for that non-real time call.

7. Apparatus as claimed in claim 5 or 6, further comprising means for transmitting call signals in said time slots in accordance with the allocation of said
10 time slots.

8. A method of communication to or from a mobile terminal at a base station connected to a communications network, comprising setting up a call between a network terminal connected to the network and the mobile terminal, including
15 - determining the maximum bandwidth allocation for that call, determining a current bandwidth allocation for the call over a wireless link between the base station and the mobile terminal, and varying the current bandwidth allocation during the call in accordance with a bandwidth demand relating to the call without exceeding said maximum bandwidth allocation.

20

9. A method as claimed in claim 8, wherein the current bandwidth allocation includes a return bandwidth allocation, further comprising receiving a demand

signal at the base station from the mobile terminal, the return bandwidth allocation being varied in accordance with said demand signal, the method further comprising transmitting from the base station to the mobile terminal allocation data indicating the return bandwidth allocation, such that the mobile terminal uses the return
5 bandwidth allocation for transmission to the base station.

10. A method as claimed in claim 8 or 9, wherein the current bandwidth allocation includes a forward bandwidth allocation, the forward bandwidth allocation being varied during the call in accordance with a forward channel
10 demand relating to the call, the method further comprising transmitting from the base station to the mobile terminal using the forward bandwidth allocation.

11. A method as claimed in claim 10, wherein the forward channel demand is derived from the quantity of data received from the network terminal during the
15 call.

12. A method as claimed in claim 10 or 11, each when dependent on claim 9, wherein the forward bandwidth allocation is determined independently of the return bandwidth allocation.

20

13. A method as claimed in any one of claims 8 to 12, wherein the step of establishing said call includes determining a minimum bandwidth allocation for

that call, and the current bandwidth allocation is varied without falling below said minimum bandwidth allocation.

14. Apparatus for communication between a mobile terminal and a network
5 terminal connected to a network, comprising:

call set-up means for setting up a call between the mobile terminal and the network terminal, said call set-up means being operable to determine a maximum bandwidth allocation for that call;

means for determining a current bandwidth allocation for the call over a
10 wireless link between the base station and the mobile terminal. and

means for varying the current bandwidth allocation during the call in accordance with a bandwidth demand relating to the call without exceeding said maximum bandwidth allocation.

- 15 15. A method of registering a communications terminal with a satellite communications system including a satellite generating a plurality of spot beams each carrying at least one spot beam transmission channel and a global beam substantially encompassing the plurality of spot beams and carrying at least one global beam reception channel and at least one global beam transmission channel,
20 said method comprising:

receiving a call on one said spot beam transmission channel;

ceasing reception of said call;

— subsequently determining whether said one spot beam transmission channel is receivable by said terminal; and,

if said one spot beam transmission channel is not receivable, transmitting a registration message in said global beam reception channel;

5 receiving a spot beam channel allocation signal in said global beam transmission channel; and

receiving a further said spot beam transmission channel selected according to said spot beam channel allocation signal.

10 16. Apparatus for a satellite communications terminal for use in a satellite communications system including a satellite generating a plurality of spot beams each carrying at least one spot beam transmission channel and a global beam substantially encompassing the plurality of spot beams and carrying at least one global beam reception channel and at least one global beam transmission channel,
15 said apparatus comprising:

a receiver for receiving a call on one of said spot beam transmission channels and subsequently ceasing reception of said call;

means for subsequently determining whether said one spot beam transmission channel is receivable by said terminal; and if said one spot beam transmission channel is not receivable, transmitting a registration message in said
20 global beam reception channel; and

— means for receiving a spot beam channel allocation signal in said global beam transmission channel and tuning said receiver to receive a further said spot beam transmission channel selected according to said spot beam channel allocation signal.

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference J24468 WO	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 97/ 03344	International filing date (day/month/year) 04/12/1997	(Earliest) Priority Date (day/month/year) 06/12/1996
Applicant INTERNATIONAL MOBILE SATELLITE ORGANIZATION et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (see Box I).
2. ☒ Unity of invention is lacking (see Box II).
3. ☐ The international application contains disclosure of a **nucleotide and/or amino acid sequence listing** and the international search was carried out on the basis of the sequence listing
 - ☐ filed with the international application.
 - ☐ furnished by the applicant separately from the international application,
 - ☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
 - ☐ Transcribed by this Authority
4. With regard to the title,
 - ☒ the text is approved as submitted by the applicant.
 - ☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,
 - ☒ the text is approved as submitted by the applicant.
 - ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.
6. The figure of the **drawings** to be published with the abstract is:

Figure No. 3

 - ☐ as suggested by the applicant.
 - ☐ because the applicant failed to suggest a figure.
 - ☒ because this figure better characterizes the invention.
 - ☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 97/03344

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-7

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-7

Method and apparatus for time slot allocation in a TDMA frame

2. Claims: 8-14

A method and apparatus of communication to or from a mobile terminal at a base station connected to a communication network

3. Claims: 15-16

A method and apparatus for registering a communication terminal with a satellite communication system

INTERNATIONAL SEARCH REPORT

International Application No

CT/GB 97/03344

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H04B7/26 H04J3/16 H04Q7/38 H04Q7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04B H04J H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 446 739 A (NAKANO MOTOHIRO ET AL) 29 August 1995 see abstract see column 1, line 46-59 see column 2, line 57 - column 3, line 26 see column 4, line 26-33 see column 4, line 44-55 see figures 1-3 see claim 1 --- -/--	1-7

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

6 May 1998

Date of mailing of the international search report

30.07.98

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
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Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Dejonghe, O

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 97/03344

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 96 08934 A (IONICA INT LTD ;ALBROW RICHARD JOHN (GB); BLACK SIMON ALEXANDER (G) 21 March 1996 see abstract see page 1, line 14 - page 4, line 2 see page 8, line 6-14 see page 10, line 6-10 see figures 1-3 see claims 1,8,12,13,15</p> <p>---</p>	1-7
A	<p>KALYAN BASU ET AL: "MULTI-RATE SERVICES: CHALLENGES IN NETWORK DESIGN" PROCEEDINGS OF THE GLOBAL TELECOMMUNICATIONS CONFERENCE (GLOBECOM), SAN FRANCISCO, NOV. 28 - DEC. 2, 1994, vol. VOL. 1, 28 November 1994, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, pages 644-649, XP000498004 see page 645, column 2 see page 646, column 1 see page 646, column 2, line 1-16 see figure 3</p> <p>---</p>	1-7
A	<p>KAUDEL F J ET AL: "PERFORMANCE OF AN EFFICIENT DISCIPLINE FOR HYBRID STM-ATM SWITCHING AND TRANSPORT" FUNDAMENTAL ROLE OF TELETRAFFIC IN THE EVOLUTION OF TELECOMMUNICATION NETWORKS, PROCEEDINGS OF THE 14TH. INTERNATIONAL TELETRAFFIC CONGRESS - ITC 1 JUAN-LEES-PINS, JUNE 6 - 10, 1994, no. 1B, 6 June 1994, LABETOULLE J;ROBERTS J W (EDS), pages 1099-1108, XP000593358 see page 1099 see page 1100, line 1-21 see page 1101, line 1-8 see page 1102, line 11-12 see page 1108, line 6-14 see figures 1,2,6</p> <p>-----</p>	1-7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

CT/GB 97/03344

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5446739 A	29-08-95	JP 6204943 A CA 2112762 A	22-07-94 07-07-94
WO 9608934 A	21-03-96	AU 3477995 A BR 9508943 A CN 1160468 A EP 0795255 A FI 971088 A JP 10505969 T ZA 9507745 A	29-03-96 11-11-97 24-09-97 17-09-97 14-03-97 09-06-98 06-05-96

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BEST AVAILABLE IMAGES

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